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29 December 1959

Director, Photographic Intelligence Center

Special Assistant for Research and Development, PIC

The Prognostic Implication of Atmospheric Effects on "T" Materials.

1. Mission 8005 resulted in the highest resolution of any mission to date. The high contrast resolution in snow covered areas ran somewhere near 110 l/mm. The low contrast resolution ran about 60 l/mm. In most of the targets the image scene was rendered mostly in the high contrast region because of the high reflectivity of the snow. The sun angle was about 17° which gave us a distorted but excellent rendition of all shadow detail. The very cold air mass was almost completely free of atmospheric haze and was extremely still providing an optically pure medium through which to photograph. The sun angle on the 12th of December was extremely low and reached its worst possible condition on 21 December. However, the sun has begun its travel northward on the ecliptic toward the equator and conditions from now on will be better every day. On the inclosed graph please note that the conditions for the best possible photographic readout will occur during the period between February and April for the area with which we are concerned. As it is for the diurnal cycle of heating the sun angle reaches its maximum at about 12:00 noon local sun time, and the maximum heat occurs at about 3 p.m. This means that in the annual cycle, even though the worst light conditions occur at the first day of winter, the cooling cycle is such that we will have a continental polar cold air mass dominating the Soviet Union until late spring. It appears that from the results of 8005 the very best part of the year for reconnaissance photography will occur during the period from the beginning of February through the end of April. The higher latitudes will become photographically feasible during the latter phases of this period as the continental polar cold air mass moves out over the Arctic Ocean to become a maritime polar cold air mass.

2. It is highly recommended that project scientific and meteorological people be asked to critique this memo from their point of view to help substantiate this scientific guess which has been brought to our attention by the high resolutions and extreme interpretability available in Mission 8005. If the convergence of evidence does show that these conditions will probably prevail, the project director should give serious thought to accenting this period with an active program.

3. Other side benefits which will be revealed through snow cover during the period between February and April when snow cover is likely to be present at high latitudes: Important intelligence clues in activity should be available through the presence of snow, for instance, buildings which are heated

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will loose the snow cover from the roofs and will dramatically stand out from those that are unheated. The ones on which snow remains will indicate that they are probably used for inactive storage. Main communication roads will be revealed because they will be cleared of their snow mantel so that traffic can move freely. Secondary, less important roads will not be cleared and less time will be spent in interpreting the details of less relative importance. High energy outputs in cooling pools for electronic and other thermo exchange units will be melted if they are in use, whereas if they are relatively inactive or unimportant they will be frozen over.

4. Undoubtedly there are other contributing factors to the marvelous resolution which was achieved on Mission 8005 other than atmospheric conditions. These probably are due to the refinements in the auto pilot, the fine focus of the cameras, and the studies which have resulted in elimination of the vibration in the camera system. These together with the performance of the new engine probably contributed substantially to a finer product from this mission. However the dramatic difference between this mission and other missions concerned primarily with resolutions appears to be enhanced by the better light transmission conditions of the atmosphere to a substantial degree.

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Attachment:
As stated

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Distribution:
0 - Addressee
1 - D/PIC subject file
1 - D/PIC chrono
1 - TISD

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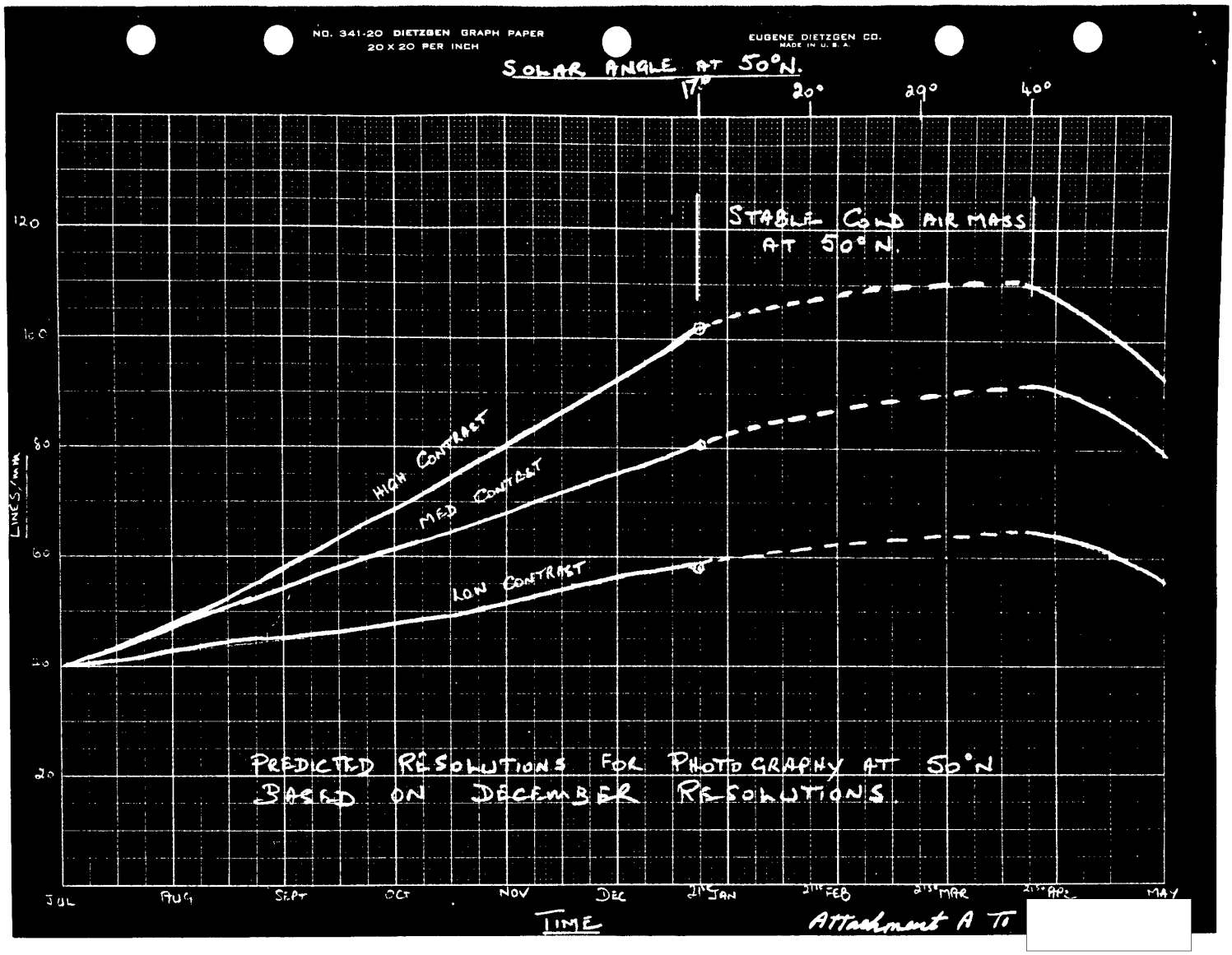

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